

common green Moſs, in a Box with a glass Cover. She brought forth ſeveral young ones, who ſlipp'd off their Skins, and the outward Membrane of their Eyes along with them, in ſix Weeks after their Birth; and they ſhed them again two Months after: But being then put into Spirits of Wine to preſerve them, they were killed; but may ſtill be seen in the *Museum* of the Society. They firſt looſen the Skin about the Mouth, and ſo ſlip it off backwards, by wriggleſing themſelves thro' the Entangle-ment of the Moſs: For ſome of the Skins were torn, and Parts ſtuck in the Moſs.

C. M.

XXI. *An Improvement of the Celeſtial Globe,*
by Mr. James Ferguſon.

Read May 14.
1747.

 **O**N the *Axis* of the *Globe*, (TAB. X. Fig. 3.) above the *Hour-Circle*, is fixed the *Arch A* at one End by the *Screw D*, ſo as to leave ſufficient Room for turning the *Hour-Index* occasionally: The other End at *B*, being always over the *Pole of the Ecliptic*, has a *Pin* fixed into it, whereon the *Collets C* and *B* are moveable by their *Wires F* and *G*, when the *Screw E* is slackned, and may be made fast at Pleaſure by this *Screw*; ſo that the turning of the *Globe* round will carry the *Wires* round with it, ſhewing thereby the apparent Motions of the *Sun* and *Moon* by the little *Balls* on their Ends at *H* and *I*. On the *Collet C*, in which the *Sun's Wire* is fix'd, there is also fix'd the *circular Plate L*, whereon the $29\frac{1}{2}$ Days of the *Moon's Age* are engraved, which have their Beginning just below the *Sun's Wire*; conſequently the *Plate L* cannot be turned without carrying the *Sun's*

Sun's Wire along with it ; by which means the Moon's Age is always counted from the Sun : And the Moon's Wire being turned so as to be under the Day of her Age on this Plate, will set her at her due Distance from the Sun for that time. These Wires being Quadrants from *C* to *H*, and from *B* to *I*, must still keep the Sun and Moon directly over the Ecliptic ; because the Center of their Motions at *C* and *B* is perpendicularly over the Pole of the Ecliptic in the *Arctic* Circle. But, because the Moon does not keep her Course in the Ecliptic, as the Sun appears to do, but has a Declination of $5\frac{1}{3}$ Degrees on each Side of it in every Lunation, she is made to screw on her Wire as far on both Sides as her Declination or Latitude amounts to. For this Purpose *K* is a small Piece of Pasteboard, to be applied over the Ecliptic at right Angles ; the middle Line *oo* standing perpendicularly thereon. From this Line there is $5\frac{1}{3}$ Degrees marked on each Side upon the outward Limb ; which reaching to the Moon, makes her to be easily adjusted to her Latitude at any time. — *N. B.* The Horizon should be supported by two semicircular Arches, instead of the usual Way of doing it by Pillars ; because the Arches will not stop the Progress of the Balls, when they go below the Horizon in an oblique Sphere.

To rectify the Globe. Elevate the Pole to the Latitude of the Place ; then bring the Sun's Place in the Ecliptic to the brazen Meridian, and set the Hour-Index to XII at Noon : Keeping the Globe in this Position, slacken the Screw *E*, and set the Sun directly over his Place in the Meridian ; which done, set the Moon's Wire under the Day of her Age for that

that time on the Plate \mathcal{D} , and she will stand over her Place in the Ecliptic for that time, and you will see in what Constellation she then is. Lastly, fasten the Wires by the Screw E , and the Globe will be rectify'd.

To find the Rising and Setting of the Sun and Moon, with their Amplitudes on the Horizon.

The Globe being rectify'd as above to the given Time, turn it round in the usual Way, and you will see the Sun and Moon rise and set for that Day on the same Points of the Horizon as they do in the Heavens. The Times of their Rising and Setting are shewn by the Hour-Index, which likewise shews the Time of the Moon's passing over the Meridian. If you want to see to greater Exactness the Rising and Setting of the Moon, find her Latitude for that Day by the *Ephemeris*; and as it is South or North, screw her so many Degrees from the Ecliptic, measuring them by the Pastboard K , applying it to the Ecliptic as above mention'd; and then turning the Globe round you will see the Time of the Moon's Rising and Setting by the Hour-Index, and her Amplitude on the Horizon for that time, as it is affected by her Latitude, which will sometimes be very considerable.

This may be very useful, especially in giving Lectures upon the Globes; because a large Company at some Distance will easily see this Sun and Moon going above and below the Horizon as they rise and set, and likewise their Appulses to different fix'd Stars: Whereas in the usual Way, when there is only the Sun's Place in the Ecliptic shewn, it is not easy

for any one to keep his Eye upon that Part of the Ecliptic as the Globe is turned round, unless it be in some remarkable Circle of Longitude; and it is not very easy to know the Moon's Place, unless at her Conjunction, Opposition, or Quadratures.

This simple *Apparatus* shews all the Varieties that can happen in the Rising and Setting of the Sun and Moon, which are very curious, especially about the Poles, where the Sun is present for one Half of the Year, and absent for the other Half; the Moon in Winter shining constantly without setting from the first to the third Quarter, in the Sun's Absence; and in Summer the full Moon is never seen at the Poles; for she sets at the first Quarter, and rises not till the third, save what may happen on account of her Latitude.

All the *Phænomena* of the Harvest-Moon become very plain by this additional Part; and in making some Trials I find, that, to some Places of the Earth, the Moon will not differ above an Hour in her Rising for fifteen Nights together, but will differ sometimes 23 Hours in her Setting, within the Compass of that fifteen Days; and for the next fifteen she will set within an Hour of the same Time, and differ 23 Hours in her Rising. This is taken in round Numbers, but may be consider'd with more Exactness by those who are better acquainted with the celestial Motions. I shall only add, that the Places of the Earth where these *Phænomena* happen, are those lying under the Polar Circles.

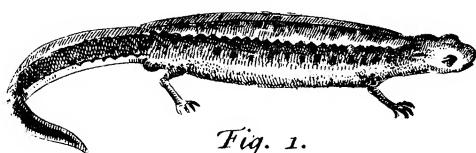


Fig. 1.

p. 534.

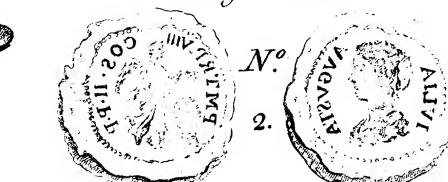


Fig. 2.

Clay Moulds



No. 2.



No. 1.



No. 3. p. 558.



No. 4.

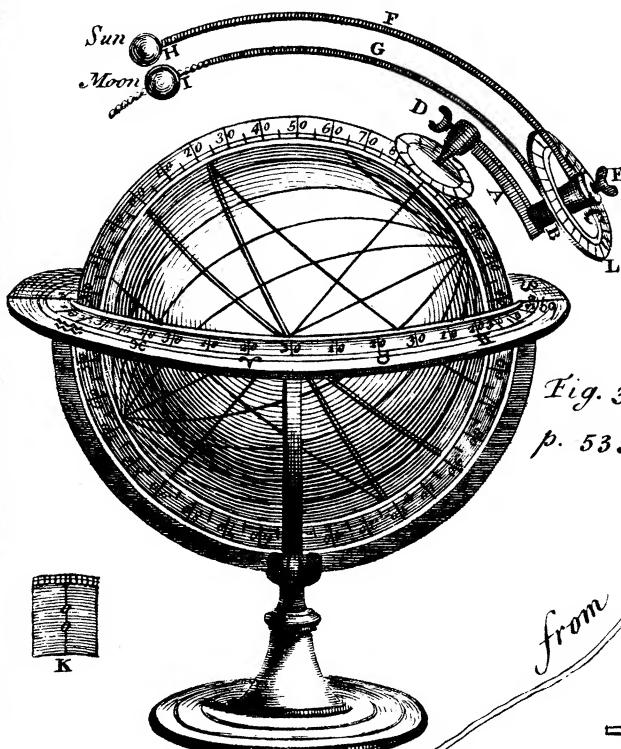
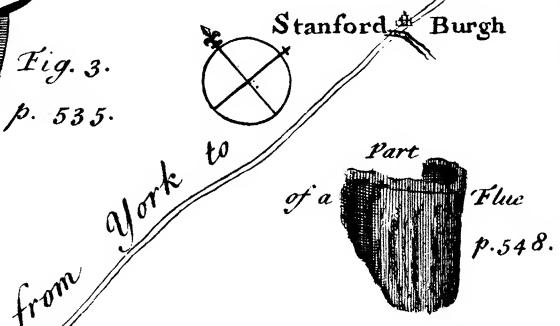


Fig. 3.
p. 535.



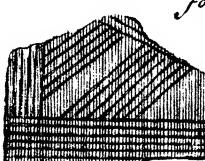
YORK.

Road



Part of a Flue
p. 548.

A Scale of Inches.
for the Pavements



and
Tiles

p. 548.



Mosaic Pavement

Bridlington and Flan

PARS

